REMARKS

Claims 1 and 2 are pending. By this Amendment, claims 1 and 2 have been amended. No new matter has been added.

Entry of the amendments is proper under 37 CFR §1.116 since the amendments: (a) place the application in condition for allowance (for the reasons discussed herein); (b) do not raise any new issue requiring further search and/or consideration (since the amendments amplify issues previously discussed throughout prosecution); (c) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (d) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection.

In particular, Applicants submit that the amendments should be entered because they are in response to the Examiner's remarks on pages 5 and 6 of the Office Action. Entry of the amendments is thus respectfully requested.

The attached Appendix includes a marked-up copy of the rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

Claim 1 is rejected under 35 U.S.C. §102(b) over Applicant's alleged admitted prior art (AAPA). The rejection is respectfully traversed.

Applicant respectfully asserts the AAPA fails to teach a reluctance type resolver comprising a stator having a plurality of excitation teeth, each of which is wound by an excitation winding so that the magnetic fluxes through all excitation teeth have the same direction and the stator includes bypass magnetic path teeth passing a magnetic flux having a direction opposite to the direction of said excitation teeth, wherein the bypass magnetic path teeth are not wound by said excitation winding as recited in Applicant's claim 1.

In contrast, as shown in Applicant's Figure 3, the AAPA has windings 12-19 around every tooth of the resolver (page 1, lines 20-23 of Applicant's specification). For at least these reasons, Applicant respectfully submits the AAPA fails to teach all the features of Applicant's claim 1. It is respectfully requested the rejection be withdrawn.

Claim 2 is rejected under 35 U.S.C. § 103(a) over the AAPA in view of Kitazawa, U.S. Patent No. 5,757,182. The rejection is respectfully traversed.

Applicant respectfully submits neither the AAPA nor Kitazawa, either alone or in combination, teach, disclose or suggest a reluctance type resolver comprising a stator, having a plurality of excitation teeth, each of which is wound by an excitation winding, a rotor having magnetic salient sections that are placed to oppose said excitation teeth, and a detector for detecting the position of said rotor, by detecting a current or voltage of the excitation winding which changes with different phase in response to the motion of said rotor, wherein each of the excitation windings is wound on each of the excitation teeth for a pair of adjacent excitation teeth such that the magnetic flux through each of the paired excitation teeth has directions opposite to each other, the excitation windings for each pair of adjacent excitation teeth are connected in series and excitation teeth are provided on the stator so that the pitch of each excitation tooth for each pair of adjacent excitation teeth equals an integral multiple of the pitch of the magnetic salient sections of the rotor and both excitation teeth in each pair of excitation teeth have the same phase for magnetic resistance change with respect to the motion of the rotor as recited in Applicant's claim 2.

Instead, the AAPA recites a resolver which comprises a rotor (11) with excitation teeth (2 - 9) in which windings (12-19) are wound in such a manner that magnetic fluxes generated at the excitation teeth (2, 4, 6 and 8) are of opposite direction from the magnetic fluxes generated at excitation teeth (3, 5, 7 and 9) and in which the permeance change with respect to the motion of the rotor (11) between the adjacent windings has a phase which is

different by ¼ pitch of the salient section (page 2, lines 13-15 of Applicant's specification). Thus, the leakage magnetic flux which is generated in adjacent excitation teeth would not be approximately the same. Accordingly, although the flux which flows through adjacent teeth would be of opposite direction because the magnitudes of the leakage magnetic flux are not substantially the same, the arrangement would not be beneficial in reducing the detection error generated by leakage magnetic flux.

In addition, Applicant respectfully submits Kitazawa fails to overcome the deficiencies of the AAPA as discussed above. In particular, Applicant respectfully submits Kitazawa specifically teaches an angle sensor characterized in that the number of the poles (3) of the exciting winding (4) equals to the number of the slots (2) and that the output windings (6 and 7) are wound so that the voltage induced in each one phase winding of the n-phase windings is sinusoidally distributed and that the exciting winding and the output windings are wound in the slots on a one-slot pitch basis in a distributed fashion (col. 2, lines 8-14). Thus, as shown in Figure 6 of Kitazawa, each slot (2) in the sensor disclosed in Kitazawa has an excitation winding which has a phase that is different than the phases of the windings on the slots to which it is adjacent. Accordingly, Kitazawa fails to teach or suggest a pair of excitation teeth with an excitation winding connected in series such that two excitation teeth, i.e. a pair, have an excitation winding of the same phase for permeance change with respect to the motion of the rotor.

For at least these reasons, Applicant respectfully submits the combination of the AAPA and Kitazawa fails to teach, disclose or suggest all the features of Applicant's claim 2. It is respectfully requested the rejection be withdrawn.

In view of the foregoing, Applicant submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1 and 2 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,

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JAO:MMI

Attachment:
Appendix

Date: February 20, 2003

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DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

APPENDIX

Changes to Claims:

The following is a marked-up version of each amended claim:

1. (Amended) A reluctance type resolver comprising:

a stator, constructed from a magnetic material, having a plurality of excitation teeth, each of which is wound by an excitation winding;

a rotor having magnetic salient sections that are placed to oppose said excitation teeth; and

a detector for detecting the position of said rotor, by detecting a current or voltage of said excitation winding which changes with different phase in response to motion of said rotor; wherein

said excitation winding is wound on each excitation teeth so that the magnetic fluxes through all excitation teeth have the same direction; and

said stator includes bypass magnetic path teeth passing a magnetic flux having a direction opposite to the direction of said excitation teeth, wherein the bypass magnetic path teeth are not wound by said excitation winding.

2. (Twice Amended) A reluctance type resolver, comprising:

a stator, constructed from a magnetic material, having a plurality of excitation teeth, each of which is wound by an excitation winding;

a rotor having magnetic salient sections that are placed to oppose said excitation teeth; and

a detector for detecting the position of said rotor, by detecting a current or voltage of said excitation winding which changes with different phase in response to the motion of said rotor; wherein

each of said excitation windings is wound on each of the excitation teeth for a pair of adjacent excitation teeth such that the magnetic flux through each of the paired excitation teeth has directions opposite to each other, and said excitation windings for ~~a~~each pair of adjacent excitation teeth are connected in series;

excitation teeth are provided on said stator so that the pitch of each excitation tooth for each pair of adjacent excitation teeth equals an integral multiple of the pitch of the magnetic salient sections of the rotor; and

both excitation teeth in each pair of excitation teeth have the same phase for magnetic resistance change with respect to the motion of the rotor.